

Melt spun fibers from blends of poly(tetrafluoroethylene) and poly(tetrafluoroethylene-co-perfluoro-alkylvinyl ether)

**Description of Technology:** The present invention concerns a fiber, comprising a composition comprising a blend of at least one poly(tetrafluoroethylene) and at least one poly(tetrafluoroethylene-coperfluoro-alkylvinylether).

## **Patent Listing:**

1. **US Patent No.** 6,436,533, Issued on August 20, 2002, "Melt spun fibers from blends of poly(tetrafluoroethylene) and poly(tetrafluoroethylene-co-perfluoro-alkylvinyl ether)" <a href="http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HTTOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&co1=AND&d=PTXT&s1=6,436,533.PN.&OS=PN/6,436,533&RS=PN/6,436,533

Market Potential: There is extensive literature on blends of PFA and PTFE. However, the vast majority of the patent and literature work involves dispersion blends where no effort has been made to produce homogeneous melts. Further, the bulk of the work involves commercial, high molecular weight PTFE materials. Typical PTFE polymers that are used to form useful articles are of extremely high molecular weight, of the order of 10.sup.7. The high molecular weight of these homopolymers creates difficulties in forming fibers via melt processes due to their high melt viscosities. On the other hand PTFE grades with viscosities low enough to be melt processed (less than 10.sup.5 Pa-s) do not exhibit useful strength as formed articles.

The conditions under which PTFE and PFA may cocrystallize is not clear in the open literature. U.S. Pat. No. 5,473,018 (Namura et al.) discloses certain blends of PTFE with PFA. The tensile strength of molded bars is measured therein. Restrictions were placed on the crystallization temperature and heat of crystallization of the PTFE (essentially requiring the PTFE to be below some threshold molecular weight). The claims of this patent concern only blend compositions containing <4% by weight PTFE. This reference also discloses blends of up to 50% PTFE content. Properties of blends of higher PTFE content were not useful in the context of this patent. Namura et al. reported that the tensile strength of molded bars of a 50% PTFE blend reported was approximately 50% of a molded bar of PFA alone. Fibers made from such blends are not mentioned.

## **Benefits:**

Stronger fibers from mix of said materials

## **Applications:**

Creating of fibers from said materials